

REMARKS

The Examiner's Action dated February 11, 2004 has been received and its contents carefully noted. In view thereof, claims 4 and 9 have been cancelled in their entirety without prejudice nor disclaimer of the subject matter set forth therein; and claims 1-3, 5-8 and 10 have been amended in order to better define that which Applicants regard as the invention. Accordingly, claims 1-3, 5-8 and 10 are presently pending in the instant application.

With reference now to the Official Action and particularly page 2 thereof, claims 1-10 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner notes that in claims 1 and 6, the exact structure of the first electrode is not clearly defined. For example, while the first electrode is described as including first and second barrier films, the overall structure of the electrode is unclear. The Examiner questions whether the first and second barrier films together constitute the entire first electrode or is there any other layer formed as part of the electrode.

As can be seen from the foregoing amendments, each of the several pending claims have been amended in order to more clearly define that which Applicants regard as the invention. Particularly, independent claims 1 and 6 have been amended in order to more clearly define the first and second electrodes as the lower electrode and upper electrode respectfully. Further, the structure of the electrodes has been further defined. Accordingly, it is respectfully submitted that claims 1-3, 5-8 and 10 are now in proper formal condition for allowance.

Further on page 2 of the Office Action, claims 1, 2, 5, 6, 7 and 10 have been rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,229,166 B1 issued to Kim

et al. This rejection is respectfully traversed in that the patent to Kim et al. neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

As the Examiner can see from the foregoing amendments, each of independent claims 1 and 6 have been amended to recite a semiconductor memory device comprising a lower electrode and an upper electrode, with claim 1 reciting that the second film of the lower electrode covers the upper and side surfaces of the first film with the lower electrode with a thickness of the second film of the lower electrode being between 70 nm and 250 nm while claim 6 sets forth that a lower electrode includes a first film of the lower electrode in contact with the contact plug, a second film of the lower electrode covering the upper surface of the first film of the lower electrode and a third film of the lower electrode covering the side surfaces of the first film in the lower electrode with the second and third films of the lower electrode preventing the diffusion of oxygen and a thickness of the second film of the lower electrode being between 70 nm and 250 nm. Clearly, the Patent to Kim et al. fails to disclose or remotely suggest these features.

Specifically, Kim et al. fails to disclose that a thickness of the second film of the lower electrode is between 70 nm and 250 nm as specifically recited in each of independent claims 1 and 6. The conductive oxide layer 113 of Kim et al. is provided for improving fatigue characteristics of the ferroelectric layer. Thus, the device set forth by Kim et al. does not require a thickness of the film such as set forth in accordance with the Applicants' claimed invention.

The Applicants' have found that the first film of the lower electrode is oxidized in the step of high-temperature sintering of the ferroelectric film, and has solved this problem by adjusting the thickness of the second film of the lower electrode to be in a range of 70-250 nm. In doing so, the second film with the lower electrode can serve as an oxygen barrier

film. As the Examiner can appreciate, in doing so, the effect illustrated in Figures 3 and 4 can be achieved. Such an effect cannot be achieved with the device of Kim et al.

Accordingly, it is respectfully submitted that independent claim 1 and 6 as well as those claims which depend therefrom clearly distinguish over the teachings of Kim et al. and are in proper condition for allowance.

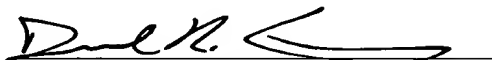
Referring now to page 3 of the Office Action, claims 3, 4, 8 and 9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kim et al. in view of U.S. Patent No. 6,078,072 issued to Okudaira et al. This rejection is likewise respectfully traversed in that the patent to Okudaira et al. does not overcome the aforementioned shortcomings associated with the teachings of Kim et al.

While the Okudaira et al. reference may disclose the use of TiN to form barrier films, this reference fails to overcome the aforementioned shortcomings associated with the teachings of Kim et al. Accordingly, in that claims 4 and 9 have been cancelled in their entirety without prejudice nor disclaimer of the subject matter set forth therein, and claims 3 and 8 indirectly depend from independent claims 1 and 6 respectfully, it is respectfully submitted that claims 3 and 8, which include all of the limitations of independent claims 1 and 6, are in proper condition for allowance.

Therefore, in view of the foregoing, Applicants respectfully request that the rejections of record be reconsidered and withdrawn by the Examiner, that claims 1-3, 5-8 and 11 be allowed, and that the application be passed to issue.

Should the Examiner believe a conference would be of benefit in expediting the prosecution of the instant application, he is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,



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